

Mathematics Department – Langholm Academy

HIGHER HOMEWORK

UNIT 1

CHAPTER 2.2

Algebraic Functions and Graphs

Homework 2

Higher - Unit 1
Functions/Related Functions

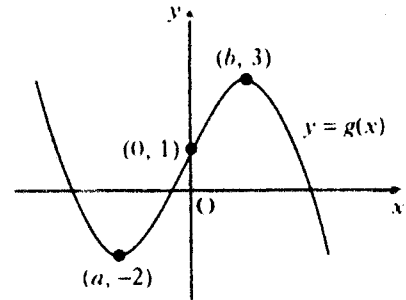
1. Two functions f and g are defined by $f(x) = 3x + 2$ and $g(x) = 3x - 2$, where x is a real number.
 - a. Find an expression for
 - I. $f(g(x))$
 - II. $g(f(x))$
 - b. Determine the least possible value of the product of $f(g(x)) \times g(f(x))$

2. Functions $f(x) = 3x + 1$ and $g(x) = x^2 + 5$ are defined on a set of real numbers.
 - a. Find $h(x)$ where $h(x) = g(f(x))$
 - b. Hence state the range of the function h

3. Functions $f(x) = x - 1$ and $g(x) = x^2$ are defined on a set of real numbers.
 - a. Find $f(g(x))$ and $g(f(x))$
 - b. The function $h(x) = f(g(x)) + g(f(x))$, show that $h(x) = 2x^2 - 2x$ and sketch the graph of h .

4. The diagram shows $y = g(x)$

- a. Sketch the graph of $y = -g(x)$
- b. On the same diagram sketch $y = 3 - g(x)$
Show the new coordinates of the marked points on each sketch.



5. The diagram shows $y = f(x)$

- a. Sketch the graph of $y = f(x + 2)$
- b. On the same diagram sketch $y = -2f(x)$

Show the new coordinates of A, B, C and D on each sketch.

